

PATENT  
Atty. Dkt. No. APPM/005819/DSM/LOW K/JP

## REMARKS

This is intended as a full and complete response to the Office Action dated February 22, 2006, having a shortened statutory period for response set to expire on May 22, 2006. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-24 remain pending in the application as shown above. Claims 1-24 are rejected.

### I. REJECTION OF CLAIMS 1-7, 9-15, AND 17-24 UNDER 35 U.S.C. §102(e).

Claims 1-7, 9-15, and 17-24 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Annapragada et al.* (U.S. Patent No. 6,518,174). Applicants respectfully traverse the rejection.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

In this case, *Annapragada et al.* does not disclose “each and every element as set forth in the claim.” For example, *Annapragada et al.* does not disclose forming a silicon oxide layer on the first organosilicate layer. The Examiner states that *Annapragada et al.* discloses a method of fabricating a damascene structure, comprising: (a) forming a barrier layer 412 on a substrate 410 having a metal layer 404 thereon; (b) forming a first organosilicate layer 416 on the barrier layer 412; (c) forming a silicon oxide layer 420 on the first organosilicate layer 416; (d) forming a second organosilicate layer 424 on the silicon oxide layer 420 (col. 2, line 46 to col. 3, line 21 and FIGS 4A-4B). However, the cited passage states that a trench stop layer 420 (silicon carbide or silicon nitride) may be placed over via level dielectric 416.

Thus *Annapragada et al.* fails to teach, show or suggest a method of fabricating a damascene structure, comprising: (a) forming a barrier layer on a substrate having a metal layer thereon; (b) forming a first organosilicate layer on the barrier layer; (c) forming a silicon oxide layer on the first organosilicate layer; (d) forming a second

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organosilicate layer on the silicon oxide layer; and (e) etching the second organosilicate layer to define vias therein, wherein the second organosilicate layer is etched with a gas mixture comprising a hydrogen-containing fluorocarbon and one or more gases selected from the group consisting of hydrogen (H<sub>2</sub>), nitrogen (N<sub>2</sub>), oxygen (O<sub>2</sub>), argon (Ar), and helium (He) as recited in independent claim 1 and claims 2-20 dependent thereon.

Furthermore, *Annapragada et al.* fails to teach, show or suggest a method for fabricating a damascene structure, comprising: (a) forming a barrier layer on a substrate having a metal layer thereon; (b) forming a first organosilicate layer on the barrier layer; (c) forming a silicon oxide layer on the first organosilicate layer; (d) forming a second organosilicate layer on the silicon oxide layer; and (e) etching the second organosilicate layer to define vias therein, wherein the second organosilicate layer is etched with a gas mixture comprising one or more hydrogen-containing fluorocarbon gases and one or more gases selected from the group consisting of hydrogen (H<sub>2</sub>), nitrogen (N<sub>2</sub>), oxygen (O<sub>2</sub>), argon (Ar), and helium (He); and (f) etching the silicon oxide layer to transfer the vias defined in the second organosilicate layer therethrough, wherein the silicon oxide layer is etched with a gas mixture comprising a fluorocarbon gas as recited in independent claim 21 and claims 22-24 dependent thereon. Therefore, withdrawal of the rejection is respectfully requested

## II. REJECTION OF CLAIMS 8 AND 16 UNDER 35 U.S.C. §103(a).

Claims 8 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Annapragada et al.* (U.S. Patent 6,518,174). The Examiner states that *Annapragada et al.* does not explicitly disclose that the second organosilicate layer is etched at a temperature within a range of about -20°C to about 80°C. The Examiner states that there is no evidence indicating the temperature range is critical and it has been held that it is not inventive to discover the optimum or workable temperature range of a result-effective variable within given prior art conditions by routine experimentation. Applicants believe that dependent claims 8 and 16 are allowable as dependent from allowable independent claim 1 as discussed above.

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**III. CONCLUSION.**

In conclusion, the reference cited by the Examiner, does not teach, show, or suggest the invention as claimed.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, Applicants believe that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

  
Keith M. Tackett  
Registration No. 32,008  
PATTERSON & SHERIDAN, L.L.P.  
3040 Post Oak Blvd. Suite 1500  
Houston, TX 77056  
Telephone: (713) 623-4844  
Facsimile: (713) 623-4846  
Attorney for Applicants